

Title: Putting Trainer

The invention relates to a practice putting device, which consists of a free-standing structure which may be placed anywhere convenient, such as indoors on a carpet or outdoors on grass, to simulate a golf hole, for practising putting.

Background

Former devices of this type have usually incorporated moving parts, some with batteries, and often involving expensive and complex constructions with moving parts, such as described in GB Patent Specification No. 22,584 W.E. Mozer.

It is an object of the present invention to provide an improved device which does not have any moving parts.

Summary of the invention

According to the present invention there is provided a practice putting device comprising a single generally L-shaped free-standing housing which in use is placed in a first position on a generally flat horizontal support surface over which a golf ball can be putted towards the device, with the rear of one limb of the housing in contact with the flat surface and the other limb pointing in a generally upward direction in the said first position, each of the limbs defining a ball guide and having an upper surface, the upper surface of the said one limb presenting a ramp up which a golf ball can roll after being putted towards the device, such that in use as a golf ball arrives at the top of the ramp a turning moment is created which causes the device to pivot like a see saw from the first position to a second position in which the rear of the said other limb is now in contact with the said flat horizontal surface, and its upper surface comprises a second ramp down which the ball can roll.

At least the said other limb may include side cheeks so that a ball will not tend to roll sideways thereof.

Typically both of the limbs include side cheeks to prevent a ball from rolling sideways off the device.

The underside of the device is shaped to define a fulcrum about which, in use, the device will rock.

The rocking of the housing from its first to its second position may be caused by or assisted by the impact of the ball on the upwardly pointing limb.

Preferably the upper surface of the ball guide of either or both of the two limbs is dished centrally so as to present a valley between two inclined sides, which in use assists in guiding a ball up or down the limb.

In one embodiment of the invention a turning moment about the fulcrum created by the weight of the said one limb, is greater than that due to the weight of the said other limb acting in the opposite sense about the fulcrum, so that in the absence of a ball the device has only one stable position in which the said one limb is in contact with the support surface, whereby in use after a ball leaves the said other limb the device will rock back and assume its said first position, ready to receive another putt.

In another embodiment of the invention a turning moment of one limb about the fulcrum is substantially the same as that due to the other, so that in the absence of a ball the device has two stable positions in which one or the other of the two limbs is in contact with the support surface. Thus for example the device will remain in the said second position after the ball has left the device, ready to receive a second putt, albeit this time from the opposite direction, and following a second putt, such that the ball runs up the ball guide surface of the said other limb, the device will rock back into its first stable position, which

enables the ball to leave the device by rolling down the upper surface of the ball guide of the said one limb, and leave the device ready to receive a putt from the original direction.

A barrier may be fitted across one of the limbs which prevents a ball from running off the limb, and serves to retain the ball thereon, thereby causing the device to remain in its said second position.

Where the limbs include side cheeks, the barrier may be fitted between the side cheeks of a limb.

In such an arrangement the barrier may be adapted to be snap-fitted between side cheeks of the limb, and is removable therefrom when not required.

The invention thus provides a device as aforesaid which in use is to rock from one position to another as a ball arrives at the top of one ramp following a successful putt, to allow the ball to leave the device down the other ramp, and which will remain in the said other position until another successful putt from the opposite direction causes a ball to run up the other ramp and cause the device to rock back into its said one position, whereafter the ball will roll down the said one ramp to leave the device, and to this end the turning moment acting about the rocking axis due to the weight of one limb, is substantially the same as that due to the weight of the other limb.

Where the device is to rock back into the said first position each time a ball leaves, the turning moment about the rocking axis due to the weight of one limb needs to be greater than that due to the other limb, so that there will be a net turning moment about the fulcrum after a ball has left the said other limb, which will cause the device to rock back, so that the said other limb is again pointing generally upwardly.

Where the ball is to be retained in the device after a successful putt, and the device is stable in its first position with the first limb presenting a ramp up which the ball will roll following a successful putt, the device may be constructed so that when a ball reaches the

upper end of that ramp, the centre of gravity of the device is shifted so as to produce a turning moment which will cause the device to rock into a second position, so that the ball will try to leave the device down the ramp in the said other limb but will be retained thereon, thereby maintaining the turning moment which caused the device to rock, and retaining the device in its second position.

Where provided the side cheeks preferably extend above and below the ball guide of each limb.

In an arrangement in which the device is to rock back into an initial position after a ball leaves it, those parts of the side cheeks of the first limb which are below the ball guide extend beyond the junction between the two limbs on the underside of the device and the extensions define the fulcrum so that it is nearer the exit end of the second limb than the entrance end of the first limb, so that when the device pivots and the underside of the second limb comes into contact with the flat horizontal surface, there will be a part of the second limb as well as the whole of the first limb on the other side of the fulcrum, thereby increasing the net turning force acting on the device to restore it to its first position, after the ball rolls off the device.

Preferably the extensions of the side cheeks of the first limb form two runners similar to the runners of a rocking chair, which extend beyond the junction between the two limbs so that as the device rocks on a flat horizontal support surface, the points of engagement between the two runners and the surface define a fulcrum line, which moves in the general direction in which the device is rocking, so that the axis of pivoting moves relative to the device as it rocks from one position to the other.

As the axis of pivoting moves so also will the centre of gravity of the device, and in the arrangement just described the centre of gravity preferably remains on the same side of the fulcrum line to produce a restoring turning movement to rock the device back into its first position, after a ball leaves the device.

The invention also provides a method of practise putting when using a device constructed in accordance with the invention such that a ball is free to run off the device after a successful putt from a given location, wherein the device rocks back and reverts to its first position after the ball rolls clear of the device, wherein a player putts a number of balls in succession towards the device, from the same given location.

The invention also provides another method of practise putting when using a device which has two stable positions in either of which it will remain without a ball remaining thereon so that the device remains in its last tipped position as a ball runs off the device, wherein after successfully putting a ball so that it now lies beyond the device, the player walks to where the ball has come to rest and putts it back towards the device, up the ball guide ramp it previously had used to exit the device, thereby causing the device to rock back to its other position to allow the ball to run down the ball guide ramp which it had previously run up from the first putt, so that only one ball is needed.

The invention provides still further a method of practise putting when using a device in which a ball is retained after being putted onto the device so that the device remains in the second position after a successful putt, and after each such putt, the player uses his putter to tap the elevated limb of the device to cause it to pivot backwards and revert to its former position with the undersides of the side cheeks of the first limb once again on the support surface, so that the ball, which has been nested in the device, is now free to roll back down the ball guide of the first limb and leave the device in the direction from which it was putted, ready to be putted again towards the waiting device.

The position of the upper end of the ramp up which a golf ball will roll after being putted towards the device, relative to a line of intersection of the two undersides of the two limbs may be such that when in use a golf ball arrives at the top of the ramp a turning moment is created causing the device to pivot like a see saw from the first position to a second position.

In some cases operation of the device depends on the extent of the said other limb beyond the fulcrum formed by the corner between the rear faces of the two limbs, measured in a direction in which the ball has to travel up the ramp formed by the first limb. However, if the ball is still travelling in a forward direction at the top of the ramp the rocking of the housing from its first to its second position is further assisted by the impact of the ball on the face of the upwardly pointing limb.

Where the upper surface of either or both of the two limbs is dished centrally the surface presents a valley between two inclined sides, and the valley so formed serves in use to guide a ball up or down the limb.

If nothing stops the ball continuing to roll down the said other limb, the ball will roll off the device. Two possibilities then exist.

If the turning moment created by the weight of the said one limb acting about the fulcrum is greater than that due to the weight of the said other limb acting in the opposite sense about the fulcrum so that the device has only one stable position (unless a ball is on the device), after the ball leaves the said other limb the device will rock back and assume its said first position, ready to receive another putt.

If on the other hand the turning moment of one limb about the fulcrum is substantially the same as that due to the other, so that when no ball is on the latter the device has two stable positions in which one or the other of the two limbs lies on the said flat horizontal surface, then the device will remain in the second position after the ball has left the device, ready to receive a second putt, albeit this time from the opposite direction. If the second putt is successful the ball will run up the inclined surface of the said other limb, causing the device to rock back into its first stable position, enabling the ball to leave the device by rolling down the upper surface of the said one limb, and leaving the device ready to receive a putt from the original direction.

Where a barrier is fitted across the upper surface of one of the limbs which prevents a ball from running off the limb, and serves to retain the ball thereon, the device will be caused to remain in its said second position.

This rocking or tipping of the device into the second position (whether the device remains in the position or subsequently rocks back to its first position) signals that the ball putted towards the device would have been successfully "holed", on a green.

Where the ball is free to run off the limb and the device automatically rocks back and reverts to its first position after each putt as the ball rolls clear of the device, a player can putt a number of balls in succession towards the device, from the same distant position.

Where the device has two stable positions in which it will remain without a ball remaining on the device, and the device remains in its last tipped position as a ball runs off the device, in theory only one ball is needed, since after successfully putting a ball so that it now lies beyond the device, the player can simply walk to where the ball has come to rest and putt it back towards the device. If the second putt is also accurate, the ball will run up the ramp it previously had used to exit the device, which will cause the device to rock back to its earlier position to allow the ball to run off the ramp which it had previously run up from the first putt, and will come to rest near from where the first putt had been made, allowing the process to be repeated as many times as is required.

Where the ball is retained in the device so that the device remains in the second position, again only one ball is needed, since after each putt the player can simply use his putter to tap the elevated limb of the device to cause it to pivot backwards and revert to its former position with the rear of the side cheeks of the first limb once again flat on the ground. In doing so the ball, which had been nested in the device is now free to roll back down the first limb and to leave the device in the direction from which it was putted ready to be putted again towards the waiting device.

The tipping action, which indicates the successful "holing" of a ball, is dependent upon the correct selection of the size and weight of the different parts of the structure.

- (a) If the device provides two similar ramps and is simply required to rock from one position to another as a ball arrives at the top of one ramp to allow the ball to leave the device down the other ramp, and the device is to remain in the position into which it has last rocked until another successful putt causes a ball to roll up and over the device, the turning moment due to the weight of each limb must be similar.
- (b) If the device is to rock back into the said first position each time the ball leaves, then the turning moment due to the weight of the one limb must be greater than that due to the said other limb, so that there will be a net turning moment about the fulcrum after a ball has left the said other limb, causing the device to rock back so that the said other limb is again pointing generally upwardly.
- (c) If the ball is to be retained in the device, the device must be stable in its first position with the first limb presenting the ramp up which the ball will roll if putted successfully, and must be such that when a ball reaches the upper end of the ramp, the centre of gravity of the device is shifted so as to produce a turning moment which will cause the device to rock about the fulcrum, so that the ball will try to run down the said other limb but will be retained thereon, thereby maintaining the turning moment which caused the device to rock and causing the device to remain in that position until the device is tapped back or the ball is manually retrieved from the device.

The invention will now be described by way of example with reference to the accompanying drawings, in which:-

Fig 1 is a perspective view of a putting practice device embodying the invention,

Fig 2 is a similar view of a modification of the device of Fig 1,

Fig 3 is a perspective view showing how devices of Fig 1 can be stacked one above the other,

Figs 4-6 are front, rear and side views of a plate which is adapted to be fitted across one end of the device of Fig 1 so as to create the Fig 2 modification,

Fig 7 is a three quarter cut away the front end of the Fig 2 device showing openings in the side cheeks for securing the plate of Figs 4-6 in place,

Fig 8 is a sequence of side elevations showing how the device of Fig 1 can be used in practice,

Fig 9 is a similar sequence of views showing how a variant of the Fig 1 device can operate in practice, and

Fig 10 is a similar sequence of views showing how the Fig 2 device can be used in practice.

Detailed description of the drawings

The same reference numerals apply to the same parts in each of the Figures in the drawings.

The device comprises a generally L-shaped housing comprising left and right hand side cheeks 10, 12 and defining two divergent limbs containing a runway therebetween comprising a first ramp 14 which leads up from a front edge 16 to a central region 18, and a second ramp 20 which runs from the central region 18 to a rear edge 22. The side cheeks 10, 12 ensure a ball which runs onto the runway will not run off sideways. The runway ramps may be flat as shown or dished centrally to centralise a golf ball as it runs up and down the ramps.

Lower edges of the side cheeks, one of which is shown at 24 in Fig. 1, form the base on which the limb containing ramp 14 will rest when in the position shown. The runway extends between and structurally joins the side cheeks 10, 12.

If desired the central region can be cut away to form a recess into which a golf ball will nest after running up a ramp so as to retain the ball in the housing. Where a recess is formed in the runway it is positioned beyond the centre of gravity of the two limbs (as viewed from one ramp) so that the weight of the nesting golf ball will cause the housing to tip and rotate so as to rest on the underside of the other limb.

An alternative nesting arrangement is shown in Fig 2 in which a plate 26 is shown fitted across the open end of the ramp 14. In this arrangement the housing is constructed so that the weight of the limb containing the ramp 20 is greater than that containing the ramp 14, so that without a ball in position the device will normally rest on the underside of the limb containing the ramp 20. A golf ball running up the latter will cause the device to pivot as the ball moves over centre, so that the ball will then run down the ramp 14, but it will not leave the ramp due to the presence of the plate 26 which blocks its exit. This will be achieved if when the ball passes the top of ramp 20 the centre of gravity of the structure (now including the ball), moves beyond the central region 18 measured in the direction of movement up the ramp 20, since this will cause the housing to pivot until it now rests on the underside of the limb containing ramp 14 instead of that containing ramp 20. In this position the limb containing ramp 20 will now be the generally upstanding limb.

The ball can be made to leave the device by tapping the upstanding limb (containing ramp 20) to rotate the device back in a reverse sense until it once again rests on the underside of the limb containing ramp 20. The ball will now run back down ramp 20 and ramp 14 and leave the device.

The plate 26 is removable to allow the device to be used in either of the two ways so far described but when in place, needs to be secured in position since it needs to break the forward movement of a ball running down the ramp 20. To this end the plate 26 includes rearwardly protruding flanges 28, 30 which are spaced apart so as to be a push fit between the side cheeks 10, 12, which are constructed from resiliently deformable material so as to allow the plate to be secured therebetween. The flanges are shown in Figs 5 and 6. A positive key between flanges and side cheeks is obtained if protrusions 32, 34, 36 and 38 are formed on the outer faces of the flanges 28, 30 which when the plate is correctly positioned register with openings 40, 42, 44 and 46 in the cheeks, as shown in the cheeks 10', 12', in Fig 7.

Figs 8a - 8e show how the device responds to the arrival of a golf ball 48 travelling in the direction of arrow 50 in Fig 8a. The ball runs up the ramp 14, to where its weight plus any impetus from its forward movement, will cause the device to tip in a clockwise manner (see arrow 52) through intermediate positions such as shown in Fig 8b, until it comes to rest on its other limb as shown in Fig 8c.

The ball 48 runs down the ramp 20 and leaves the device in the direction of arrow 54.

Once the ball has left the device, the weight of the now generally upright limb containing the ramp 14, creates a turning moment which causes the device to rock back from the position shown in Fig 8c through the position shown in Fig 8d (see arrow 56) until finally it resumes the position of equilibrium shown in Fig 8e, (which corresponds to that shown in Fig 8a) ready to receive another putt.

If the weights of the two limbs are generally similar, the device will have two stable positions in which it will remain once the ball has left the device, and the device can be arranged to operate as shown in Fig 9.

Here a ball 48 moving in the direction of arrow 50 towards the device as shown, will run up the ramp 14. When it reaches the middle region 14 of the runway momentum of the

ball and the shift in the centre of gravity of the device with the ball thereon, will cause the device to rotate in a clockwise manner as shown (see arrow 52), through the intermediate position shown in Fig 9(b), eventually to reach its other position of stable equilibrium as shown in Fig 9(c). The ball is now free to run off the ramp 20 and leave in the direction of arrow 54.

Since the position shown in Fig (c) is one of stable equilibrium, the device will remain in that position until the ball (or another ball) is putted towards the ramp 20, in the direction of arrow 58 as shown in Fig 9. As it rolls up the ramp 20 the centre of gravity of the combination of ball and device shifts to the left creating an anticlockwise turning moment in the direction of arrow 60 in Fig 9(e), causing the device to rotate through the intermediate position of Fig 9(e) back into the original rest position as shown in Fig 9(f). This allows the ball to continue in its right to left direction down the ramp 14 to leave the device in the direction of arrow 62 in Fig 9(f).

The device will remain in this position (shown in Fig 9(f)) indefinitely, until the process is repeated and the ball (or another ball) is putted towards and up the ramp 14 so that the process as described with reference to Fig 9(a) is repeated.

If the device is modified by fitting the plate 26 as shown in Figs 2 and 4 to 7, a different mode of operation is achieved, since the ball is now held captive in the device. This is best seen from Fig 10 in which the limb-containing ramp 20 is resting on the ground 51.

In Fig 10(a) a ball 48 is shown beginning to roll up the ramp 20 after having been putted towards the device. As it reaches the top of the ramp the centre of gravity of the combination of ball and device moves and creates a clockwise turning movement (see arrow 52 in Fig 10(b)), causing the device to rock through the intermediate position of Fig 10(b) until the other limb-containing ramp 14 rests on the ground 51. The ball rolls down the ramp 14 but is prevented from leaving the ramp by the plate 26. The weight of the ball at the end of ramp 14 keeps the device in the position shown in Fig 10(c).

A light tap of the upstanding limb in the direction of the arrow 64 in Fig 7 such as by means of a putter 66 (see Fig 10(d)), will tip the device back towards its first position, and this tipping action propels the ball 48 back down the ramp 14. Its momentum will assist in rocking the device towards and through the position shown in Fig 10(e) until the device occupies its original position shown in Fig 10(f). The ball will then run off the ramp 20 to a position a short distance in front of the edge 22, from where a further putt can be attempted.

The housing is preferably constructed as a one piece plastics moulding.

In manufacturing the housing it is necessary to take into account the need for the centre of gravity to be correctly positioned to provide the required tipping moment when the ball reaches the middle region 14. Thus the thickness of the plastics material may be altered as between one part of the housing and another, or weights can be added, for example to the underside of the ramps 14 and 20, or to the end panel 26.

It has been found to be advantageous if the overall weight of the housing is approximately 80 grams.

As shown in the Figures the side cheeks 10, 12 can be extended beyond the rear of the central region 18 as denoted by 13 in Fig 1. The extensions (one of which is shown at 13) correspond to the runners of a rocking chair, define a rolling fulcrum and determine the inclination of ramp 20 when the device pivots from the position of Fig 1.

By flaring outwardly the lower parts of the side cheeks below the ramp 14 and central region 18, so devices can be stacked one on top of another as shown in Fig 3 where housings can be fitted one over another as shown in Fig 3 this not only reduces the space required for storing and/or displaying the devices for retailing, but also reduces the volume occupied by a plurality of such devices when packed for transportation or storage.